

CLAIMS

1. An organic electroluminescent device, comprising:
 - a first conductive layer having a first type of conductivity;
 - a first host material layer, placed at the top side of said first conductive layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of an external bias voltage;
 - a second host material layer, placed at the top side of said first host material layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source under the effect of said external bias voltage; and
 - a second conductive layer having a second type of conductivity, placed at the top side of said second host material layer.
2. An organic electroluminescent device, comprising:
 - a first conductive layer having a first type of conductivity;
 - a second carrier blocking layer placed at the top side of said first conductive layer;
 - a first host material layer, placed at the top side of said second carrier blocking layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of an external bias voltage;
 - a second host material layer, placed at the top side of said first host material layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source under the effect of said external bias voltage; and
 - a second conductive layer having a second type of conductivity, placed at the top side of said second host material layer.
3. An organic electroluminescent device, comprising:
 - a first conductive layer having a first type of conductivity;
 - a first host material layer, placed at the top side of said first conductive layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of an external bias voltage;
 - a second host material layer, placed at the top side of said first host material layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source under the effect of said external bias voltage;
 - a first carrier blocking layer placed at the top side of said second host material layer; and
 - a second conductive layer having a second type of conductivity, placed at the top

side of said first carrier blocking layer.

4. The organic electroluminescent device according to Claim 3, wherein said first host material layer is a DPVBi layer, and said second host material layer is a CBP layer.

5. The organic electroluminescent device according to Claim 3, wherein said first host material layer is a DPVBi layer, and said first guest luminous substance is DSA.

6. The organic electroluminescent device according to Claim 3, wherein said second host material layer is a CBP layer, said second guest luminous substance is Ir (PPy) 3, and said third guest luminous is DCM2.

7. The organic electroluminescent device according to Claim 3, wherein said first guest luminous substance is selected from the group consisting of fluorescence substance, phosphorescence substance, or the combination thereof.

8. The organic electroluminescent device according to Claim 3, wherein said second guest luminous substance is selected from the group consisting of fluorescence substance, phosphorescence substance, or the combination thereof.

9. The organic electroluminescent device according to Claim 3, wherein said third guest luminous substance is selected from the group consisting of fluorescence substance, phosphorescence substance, or the combination thereof.

10. An organic electroluminescent device, comprising:

- a first conductive layer having a first type of conductivity;

- a second carrier blocking layer placed at the top side of said first conductive layer;

- a first host material layer, placed at the top side of said second carrier blocking layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of an external bias voltage;

- a second host material layer, placed at the top side of said first host material layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source under the effect of said external bias voltage;

- a first carrier blocking layer placed at the top side of said second host material layer; and

- a second conductive layer having a second type of conductivity, placed at the top side of said first carrier blocking layer.

11. An organic electroluminescent device, comprising:

- a first conductive layer having a first type of conductivity;

- a second host material layer, placed at the top side of said first conductive layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source

under the effect of an external bias voltage;

a first host material layer, placed at the top side of said second host material layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of said external bias voltage; and

a second conductive layer having a second type of conductivity, placed at the top side of said first host material layer.

12. An organic electroluminescent device, comprising:

a first conductive layer having a first type of conductivity;

a first carrier transporting layer placed at the top side of said first conductive layer;

a second carrier blocking layer placed at the top side of said first carrier transporting layer;

a second host material layer, placed at the top side of said second carrier blocking layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source under the effect of an external bias voltage;

a first host material layer, placed at the top side of said second host material layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of said external bias voltage;

a first carrier blocking layer placed at the top side of said first host material layer; and

a second conductive layer having a second type of conductivity, placed at the top side of said first carrier blocking layer.

13. An organic electroluminescent device, comprising:

an anode;

a hole transporting layer placed at the top side of said anode;

an electron blocking layer placed at the top side of said hole transporting layer;

a first host material layer, placed at the top side of said electron blocking layer, having a first guest luminous substance mixed therein for projecting a first color light source under the effect of an external bias voltage;

a second host material layer, placed at the top side of said first host material layer, having a second guest luminous substance and a third guest luminous substance mixed therein for projecting a second color light source and a third color light source under the effect of said external bias voltage;

a hole blocking layer placed at the top side of said second host material layer;

an electron transporting layer placed at the top side of said hole blocking layer; and

a cathode placed at top side of said electron transporting layer.

14. The organic electroluminescent device according to Claim 13, wherein the bottom side of said anode is further placed with a light-transparent substrate.
15. The organic electroluminescent device according to Claim 13, wherein said first color light source is blue, said second color light source is green, and said third light source is red.
16. The organic electroluminescent device according to Claim 13, wherein said first guest luminous substance, said second guest luminous substance, and said third guest luminous substance are selected from the group consisting of fluorescence substance, phosphorescence substance, or the combination thereof, respectively.
17. The organic electroluminescent device according to Claim 13, wherein said hole blocking layer is a BCP layer.
18. The organic electroluminescent device according to Claim 13, wherein said electron blocking layer is a LiF layer.
19. An organic electroluminescent device, comprising:
- a light-transparent substrate;
 - an anode placed at the top side of said light-transparent substrate;
 - a hole injecting layer placed at the top side of said anode;
 - a hole transporting layer placed at the top side of said hole injecting layer;
 - a DPVBi layer, placed at the top side of said hole transporting layer, having a DSA mixed therein for projecting a blue light source under the effect of an external bias voltage;
 - a CBP layer, placed at the top side of said DPVBi layer, having Ir (PPy) 3 and DCM2 mixed therein for projecting a green light source and a red light source under the effect of said external bias voltage;
 - an electron transporting layer placed at the top side of said CBP layer;
 - an electron injecting layer placed at the top side of said electron transporting layer;
 - and
 - a cathode placed at top side of said electron injecting layer.
20. The organic electroluminescent device according to Claim 19, wherein said hole injecting layer is a CuPc layer.
21. The organic electroluminescent device according to Claim 19, wherein said electron injecting layer is an Alq layer.
22. A method for producing an organic electroluminescent device, comprising the steps of:
- forming a first host material layer onto the top side of a conductive layer, a first guest luminous substance mixed into said first host material layer;
 - forming a second host material layer onto the top side of said first host material layer, a second guest luminous substance and a third guest luminous substance mixed

into said second host material layer; and

forming a second conductive layer onto the top side of said second host material layer, a first color light source projected from said first guest luminous substance and a second color light source projected from said second guest luminous substance, and a third color light source projected from said third guest luminous substance under the effect of an external bias voltage applied between said first conductive layer and said second conductive layer.

23. The method according to Claim 22, further comprising the step of:

forming an electron blocking layer onto the top side of said first conductive layer, and subsequently forming said first host material layer and said second host material layer onto the top side of said electron blocking layer in turn.

24. The method according to Claim 22, further comprising the step of:

forming a hole blocking layer onto the top side of said second host material layer, and subsequently forming said second conductive layer onto the top side of said hole blocking layer.

25. The method according to Claim 22, further comprising the step of:

forming a hole transporting layer onto the top side of said first conductive layer, and subsequently forming said first host material layer, said second host material layer, and said second conductive layer onto the top side of said hole transporting layer in turn.

26. The method according to Claim 22, further comprising the step of:

forming an electron transporting layer onto the top side of said second host material layer, and subsequently forming said second conductive layer onto the top side of said electron transporting layer.

27. The method according to Claim 22, wherein said first guest luminous substance, said second guest luminous substance, and said third guest luminous substance are selected from the group consisting of fluorescence substance, phosphorescence substance, or the combination thereof, respectively.

28. The method according to Claim 22, wherein said first host material layer is a DPVBi layer, said first guest luminous substance is DSA, said second host material layer is a CBP layer, said second guest luminous substance is Ir (PPy) 3, and said third guest luminous substance is DCM2.

29. A method for producing an organic electroluminescent device, comprising the steps of:

forming a second host material layer onto the top side of an anode, a second guest luminous substance and a third guest luminous substance mixed into said second host material layer;

forming a first host material layer onto the top side of said second host material

layer, a first guest luminous substance mixed into said first host material layer; and forming a cathode onto the top side of said first host material layer, a first color light source projected from said first guest luminous substance, a second color light source projected from said second guest luminous substance, and a third color light source projected from said third guest luminous substance under the effect of an external bias voltage applied between said anode and said cathode.

30. An organic electroluminescent device, comprising:

- a first conductive layer having a first type of conductivity;

- a first host material layer, placed at the top side of said first conductive layer, having a phosphorescence substance mixed therein for projecting a red light;

- a second host material layer, placed at the top side of said first host material layer, having a second fluorescence substance and a third phosphorescence substance mixed therein for projecting a blue light and a green light, respectively; and

- a second conductive layer having a second type of conductivity, placed at the top side of said second host material layer.

31. An organic electroluminescent device, comprising:

- a first conductive layer having a first type of conductivity;

- a first host material layer, placed at the top side of said first conductive layer, having a phosphorescence substance mixed therein for projecting a green light;

- a second host material layer, placed at the top side of said first host material layer, having a second fluorescence substance and a third phosphorescence substance mixed therein for projecting a blue light and a red light, respectively; and

- a second conductive layer having a second type of conductivity, placed at the top side of said second host material layer.

32. An organic electroluminescent device, comprising:

- a first conductive layer having a first type of conductivity;

- a first host material layer, placed at the top side of said first conductive layer, having a fluorescence substance mixed therein for projecting a blue light;

- a second host material layer, placed at the top side of said first host material layer, having a second phosphorescence substance and a third phosphorescence substance mixed therein for projecting a green light and a red light, respectively; and

- a second conductive layer having a second type of conductivity, placed at the top side of said second host material layer.